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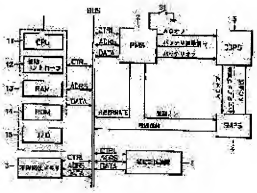
(54) COMPUTER SYSTEM AND METHOD FOR SUSPENDING THE SAME AND METHOD FOR RESUMING THE SAME

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a computer system with a further flexible hibernation mode and a method for controlling it.
SOLUTION: This system is composed of a host part 1, power source managing part 2, power source part 3 for data backup, power supplying part 4, auxiliary storage device 5, and memory 6. When a batter driving signal is outputted from the power source 3 for data backup due to power failure, the power source managing part 2 outputs an interrupting signal according to a program, the host part 1 backups present data to the auxiliary storage device 5 according to the interruption signal, and outputs a power source interruption instruction word, and the power source managing part 2 interrupts the power supply of this system by outputting a main power source interruption signal according to the power source interruption instruction word, or interrupts the power supply from the system by outputting a battery power source interruption signal. When a wake-up signal is inputted in the power supply interruption state, the power supply is resumed by outputting a power supply signal. When the power failure state is released, and the power supply is resumed, the host part restores a data/working environment, discriminates the wake-up source, and executes an operation according to it.



CLAIMS

[Claim(s)]
[Claim 1]In a computer system characterized by comprising the following, the :aforementioned power-supply-management department, A case where a phenomenon does not occur in peripheral equipment over fixed time, and a case where a battery-operated signal is outputted by interruption to service from said power supply section for data backup, When an instruction word according to execution of a specific program set up by scheduling is inputted, output an interrupt signal and the; aforementioned host section, After backing up present work environment and data to said auxiliary storage unit according to said interrupt signal, output a power-supply-cutoff instruction word and the; aforementioned power-supply-management department, .
[whether a main power supply cutoff signal is outputted and current supply of a system is made to intercept according to said power-supply-cutoff instruction word, and] If output a battery power source cutoff signal, battery power source supply is made to intercept, current supply from a system is interrupted and a wake rise signal is inputted by the; aforementioned current supply cut off state, If said power-supply-management department outputs a power supply signal, current supply is made to resume, or an interruption state is canceled and current supply is resumed, . After restoring data and work environment by which said host section was backed up, a source of a wake rise which outputted said wake rise signal is distinguished, and it is characterized by performing operation according to a source of a wake rise. A computer system.
A host section.
A power-supply-management department.
A power supply section for data backup.
A power supplying part, an auxiliary storage unit, and a memory.

[Claim 2]If it has a switch which chooses a function with possible a user intercepting current supply of a system for convenience' sake at arbitrary time, and making data under present work back up and the; aforementioned switch operates, The computer system according to claim 1, wherein said power-supply-management department outputs an interrupt signal and current supply to a system is intercepted.
[Claim 3]Where current supply of :system was intercepted and data under present work is backed up, said power-supply-management department, If a signal corresponding to execution of a signal input and prescribed operation is outputted from a source of a wake rise, A case where a phenomenon does not occur in peripheral equipment over a source interface part of a wake rise and; fixed time which output a wake rise signal which carries out the wake rise of the system, If an interrupt signal is outputted and a power-supply-cutoff instruction word is inputted from said host section a case where a battery-operated signal by interruption-to-service generating is inputted, when an instruction word according to scheduling was inputted, or when said switch operates, Output an applicable main power cutoff signal or a battery cutoff signal, make current supply of a system intercept, and by a current supply cut off state of said system. A case where the switch operates again when a wake rise signal is inputted, A controller which outputs a power supply signal and makes current supply of a system resume once again when predetermined time set up beforehand passes;. It is characterized by consisting of an interface

which performs a control signal and data communications between said controller, said power supplying part, and said host, and;. The computer system according to claim 1.
[Claim 4]Said interface part : An address outputted from said host section is decoded, An address decoder which outputs an applicable output enabling signal and a latch enabling signal; according to a signal outputted from said address decoder, It drives according to a host interface control part and; latch enabling signal which output an applicable signal in order to control a data input/output between said host section and said controller, The computer system according to claim 3 which drives according to an input port and; output enabling signal which latch data outputted from said host section, and is characterized by consisting of an output port which outputs data outputted from said controller, and a control signal on a system bath, and;.
[Claim 5]Said controller : if a wake rise signal is outputted from said source interface part of a wake rise, The computer system according to claim 3 by which carrying out a comparative judgment to a masking bit set as an internal register, a power supply driving signal's outputting an output signal when a wake rise signal is permission (enabling), and a wake rise signal being disregarded in prohibition (disable).
[Claim 6]Said host section : if an interrupt signal is outputted from said power-supply-management department, A current supply interception setup flag stored in said memory is checked, When current supply interception mode is set up, data and work environment are backed up, The computer system according to claim 1 constituting so that a battery power source interception cutoff signal may be outputted to a power supply section for data backup and it may be in a power OFF state, when current supply interception mode is not set up.
[Claim 7]If a power supply is again supplied by :system power supply cut off state, said host section, A current supply interception setup flag stored in said memory is checked, The computer system according to claim 1 constituting so that data and work environment may be restored, when the usual boot processing is performed when system power supply interception mode is not set up, and system power supply interception mode is set up.
[Claim 8]After a power supply is again supplied where current supply to :system was intercepted and data under present work is backed up, and said host section restored work environment and data, The computer system according to claim 1 which current supply of a system is intercepted and is characterized by resuming operation performed before a state under work by which DETAGA backup was carried out when a source of a wake rise which outputted a wake rise signal is said switch.
[Claim 9]After a power supply is again supplied where current supply to :system was intercepted and data under present work is backed up, and said host section restored work environment and data, The computer system according to claim 1 intercepting current supply of a system again and storing data under work after a source of a wake rise which outputted a wake rise signal performs operation corresponding to fax or ring signal transmission of a modem.
[Claim 10]After a power supply is again supplied where current supply to :system was intercepted and data under present work is backed up, and said host section restored work environment and data, The computer system according to claim 1 executing a reserved program in being what depended on time progress set up in order that a source of a wake rise which outputted a wake rise signal might perform a program by which scheduling was carried out.
[Claim 11]The computer system according to claim 3, wherein said power-supply-management department comprises one integrated circuit.
[Claim 12]A host section.
A power-supply-management department and volatile memory.
In being the computer system provided with the above and executing a program reserved at time by which a user was ******(ed), the :aforementioned host section, While recording time reserved by timer of said power-supply-management department and storing a flag of a program executed in said nonvolatile memory, Output a current supply instruction word to said power-supply-management department, and the; aforementioned power-supply-management department, While outputting a current supply cutoff signal and intercepting current supply of a computer system, When current supply is resumed after it, a power supply signal is generated at time reserved by said timer and; current supply is resumed, said host section, It is constituted so that a

reservation program which checked a flag stored in said volatile memory, and was set as said flag may be executed.

[Claim 13]A case where interception of current supply arises by sudden interruption to service or a user's error working [a system], A step which outputs an interrupt signal when a phenomenon does not occur from peripheral equipment over fixed time, or when an instruction word set up by scheduling is set up; if said interrupt signal is outputted, A step which judges whether a flag for a central processing unit checking a setup flag and making current supply of a system intercept is set up; when the mode for making current supply of said system intercept is set up, A step which stores a hardware state of the present computer in a memory, and stores the contents of all the memories in an auxiliary storage unit; It is judged whether said present state is an interruption state, In being a cut off state of current supply by interruption-to-service generating, A step which outputs a battery cutoff signal to a power supply section for data backup, intercepts battery supply, and is made into a power OFF state; in not being a current supply cut off state by said interruption-to-service generating, . A main power supply cutoff signal is outputted to a power supplying part, a common power supply impressed is intercepted, a battery power source is supplied, and it is characterized by consisting of a step changed into the state where current supply to a system is intercepted, and;.A suspension method of a computer system.
[Claim 14]If the switch with which it was equipped separately operates in order for a user to intercept current supply of a system for convenience' sake at arbitrary time and to make data under present work back up, A suspension method of the computer system according to claim 13 by which a step which outputs an interrupt signal being included further.
[Claim 15]If interruption to service is canceled after current supply to a system was intercepted by interruption-to-service generating and data under work has been backed up, Where current supply to a step and; system by which current supply to a system is resumed was intercepted and data under work is backed up, When predetermined time set up so that a wake rise signal might be outputted from a source of a wake rise, a wake rise signal might not occur over predetermined time but a wake rise might be carried out automatically passes, Where current supply to a step and; system by which current supply to a system is resumed was intercepted and data under work is backed up, If current supply is resumed, a flag of a step which performs initialization and a self-test of a system, and; current supply cut off state will be checked, When the present state is not in a state which intercepted current supply of a system and backed up data under work, A step which performs the usual boot processing; When the mode which intercepted current supply of said system and was made to back up data under work is set up, the contents of all the memories are restored from an auxiliary storage unit, A source of a wake rise which outputted a step and; wake rise signal which restore work environment to a state before intercepting current supply of a system and backing up data is distinguished, A resume method of a computer system consisting of a step which performs predetermined operation according to a source of a wake rise, and;.
[Claim 16]In a step which performs predetermined operation according to said source of a wake rise, When a source of a wake rise which required a wake rise where current supply of a system was intercepted and data under work is backed up is what is depended on switching action with which it was equipped separately, After a source of a wake rise which required a step which resumes work done before intercepting current supply of a system and making data under work back up, and; wake rise performs applicable operation according to fax or ring signal transmission of a modem, In being what is depended on time progress reserved in order that a source of a wake rise which required a step which intercepts current supply of a system again and backs up data under work, and; wake rise might perform a program by which the SUKEJU ring was carried out, A resume method of the computer system according to claim 15 consisting of a step which performs a set-up program module, and;.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention about a computer system and a method for controlling the same more particularly, By adding an interface logic with the host of a computer system separately, and enabling the data between a host and an interface controller, and electrical transmission of an instruction word, Alternative masking of the sauce (source of a wake rise) which requires a wake rise in the state of a hibernation, Or various motion control is possible in the state of a hibernation, and it is further related with a computer system applicable also to a system and a method (the suspension method and a resume method) for controlling the same other than PC (personal computer).
[0002]
[Description of the Prior Art]According to technical development of a computer, the side of not only development in the function surface but saving of energy only comes to be taken into consideration, and the energy saving function of the computer according to it is developed.
[0003]With use of a power-saving element, PC which supports the power supply saving (power saving) function by the present is supporting suspend mode through the addition of PMS (Power Management System) control logic, etc. in order to support this.
When the system is not operating after it takes a step more forward and fixed time passes, It is designed support to what is called hibernation mode that stores the input output state (I/O state) of the present system in the certain area of HDD (hard disk driver), and does not supply the power supply itself.

[0004]Generally, the above conventional computer systems are provided with two functions described below.
[0005]When a power supply is intercepted by the sudden interruption to service produced in the first place while using a computer, or malfunction, After storing the work condition in the present computer in an auxiliary storage unit like a hard disk, if a power supply is supplied again, it has the auto-recovery function in an emergency which returns a working state to the state before power supply cutoff according to the contents stored in the auxiliary storage unit.
[0006]In not using [second] a computer over fixed time in the state where the user is working the computer, After storing the work condition in the present computer in an auxiliary storage unit like a hard disk and intercepting a power supply automatically, if a user supplies a power supply again, it has the energy saving function constituted so that the contents stored in the auxiliary storage unit might be restored in the state before power supply cutoff.
[0007]Also in the latest personal computer (PC), the computer system by which the auto-recovery function in an emergency or an energy saving function is carried has won popularity, and the demand commercial scene is being expanded.
[0008]As conventional technology relevant to this invention about the auto-recovery function or electrical machinery ability in the above emergencies, "An auxiliary power supply for the work environment backup in an emergency" of the application number No. (filing date December 30, 1993) 31255 [93 to] of the South Korean patent application, "A stop crack control device and

its method" of the application number No. (filing date: June 20, 1994) 13919 [94 to] of country patent application, "A power controller of computer-related peripherals" of the application number No. (filing date: March 4, 1993) 3116 [93 to] of country patent application, "The source holding signal generation circuit of computer-related peripherals" of the application number No. (filing date: 1992 every year August 13) 14590 [92 to] of country patent application, The "network hibernation" etc. of the application number No. (filing date: October 25, 1994) 27299 [94 to] of country patent application is mentioned.

[0009]However, in the above conventional computer systems. When there is no signal input by a user over fixed time, Since the current supply to a system is intercepted automatically, in order for a user to supply a power supply again and to make a former state restore work (i.e., in order to carry out the wake rise of the system), an electric power switch must be operated.

[0010]In order to solve inconvenient [by the operation of said electric power switch], the product to which the function in which the wake rise of the system can be carried out without being based on an electric power switch was added is shipped at the beginning of 1995.

[0011]In the case of the product shipped at the beginning of the above-mentioned 1995, it is constituted so that the wake rise of a system may accomplish also with the ring signal of a keyboard input, and fax or a modem in addition to an electric power switch. as art relevant to this function, there is "the hibernation in which the work restoration by a key signal input is possible" of the application number No. (filing date: December 22, 1995) 35953 [94 to] of the South Korean patent application, and, There, if a hibernation occurs, while intercepting the power supply of all the devices, a special emergency power supply is supplied only to a microcomputer and a keyboard, and if the signal according to a user's keyboard grabbing is inputted, the art which supplies a power supply again and restores work in the former state is indicated.

[0012]

[Problem(s) to be Solved by the Invention]However, in the above-mentioned conventional computer system, in order to have checked the auxiliary device etc. which output the source of a wake rise, i.e., a wake rise signal, or to have masked the wake rise demand according to each source of a wake rise, it had the problem that there was a fixed limit. In the conventional computer system, it had the problem that it could not go into hibernation mode for the sake of a user's convenience at arbitrary time.

[0013]This invention is made in view of the above conventional problems, and the purpose, By adding an interface logic with the host of a system separately, and enabling the data between a host and an interface controller, and input and output of an instruction word, Alternative masking of the sauce (source of a wake rise) which requires a wake rise in the state of a hibernation, Or it is possible to check the auxiliary device etc. which output a wake rise signal, It is in providing a computer system which was new and was improved and a method (the suspension method and a resume method) for controlling the same which can furthermore be gone into hibernation mode at arbitrary time according to a user's convenience.

[0014]

[Means for Solving the Problem]In order to solve an aforementioned problem, according to the 1st viewpoint of this invention, a host section, A computer system provided with a power-supply-management department, a power supply section for data backup, a power supplying part, an auxiliary storage unit, and a memory, To claim 1, like a statement said power-supply-management department, A case where a phenomenon does not occur in peripheral equipment over fixed time, and a case where a battery-operated signal is outputted by interruption to service from said power supply section for data backup, When an instruction word according to execution of a specific program set up by scheduling is inputted, output an interrupt signal and the; aforementioned host section, After backing up present work environment and data to said auxiliary storage unit according to said interrupt signal, output a power-supply-cutoff instruction word and the; aforementioned power-supply-management department, . [whether a main power supply cutoff signal is outputted and current supply of a system is made to intercept according to said power-supply-cutoff instruction word, and] If output a battery power source cutoff signal, battery power source supply is made to intercept, current supply from a system is interrupted and a wake rise signal is inputted by the; aforementioned current supply cut off

state, If said power-supply-management department outputs a power supply signal, current supply is made to resume, or an interruption state is canceled and current supply is resumed, After restoring data and work environment by which said host section was backed up, a source of a wake rise which outputted said wake rise signal is distinguished, and it is characterized by performing operation according to a source of a wake rise.
[0015]Like a statement to claim 2, to the above-mentioned computer system a user, If a switch which chooses a function with possible intercepting current supply of a system for convenience' sake at arbitrary time, and making data under present work back up is formed and the switch operates, It may constitute so that said power-supply-management department may output an interrupt signal and current supply to a system may be intercepted.
[0016]A power-supply-management department of the above-mentioned computer system, Where [according to claim 3] current supply of a system was intercepted and data under present work is backed up like, If a signal corresponding to execution of a signal input and prescribed operation is outputted from a source of a wake rise, A case where a phenomenon does not occur in peripheral equipment over a source interface part of a wake rise and; fixed time which output a wake rise signal which carries out the wake rise of the system, If an interrupt signal is outputted and a power-supply-cutoff instruction word is inputted from said host section a case where a battery-operated signal by interruption-to-service generating is inputted, when an instruction word according to scheduling was inputted, or when said switch operates, When output an applicable main power cutoff signal or a battery cutoff signal, current supply of a system is made to intercept and a wake rise signal is inputted by a current supply cut off state of said system, when the switch operates again, or when predetermined time set up beforehand passes, A controller which outputs a power supply signal and makes current supply of a system resume once again; it can constitute from an interface which performs a control signal and data communications between said controller, said power supplying part, and said host.

[0017]An interface part of the above-mentioned computer system, The address according to claim 4 outputted from said host section like is decoded, An address decoder which outputs an applicable output enabling signal and a latch enabling signal; according to a signal outputted from said address decoder, It drives according to a host interface control part and; latch enabling signal which output an applicable signal in order to control a data input/output between said host section and said controller, It drives according to an input port and; output enabling signal which latch data outputted from said host section, and data outputted from said controller and a control signal can consist of output ports outputted on a system bath.
[0018]A controller of the above-mentioned computer system, If a wake rise signal is outputted to claim 5 from said source interface part of a wake rise like a statement, A comparative judgment is carried out to a masking bit set as an internal register, when a wake rise signal is permission (enabling), a power supply driving signal outputs an output signal, and it can constitute so that a wake rise signal may be disregarded in prohibition (disable).
[0019]A host section of the above-mentioned computer system, If an interrupt signal is outputted to claim 6 from said power-supply-management department like a statement, A current supply interception setup flag stored in said memory is checked, When current supply interception mode is set up, data and work environment can be backed up, and it can constitute so that a battery power source interception cutoff signal may be outputted to a power supply section for data backup and it may be in a power OFF state, when current supply interception mode is not set up.
[0020]Or a host section of the above-mentioned computer system, If a power supply is again supplied to claim 7 by a system power supply cut off state like a statement, When a current supply interception setup flag stored in said memory is checked and system power supply interception mode is not set up, the usual boot processing can be performed, and it can constitute so that data and work environment may be restored, when system power supply interception mode is set up.
[0021]Or a host section of the above-mentioned computer system, After supplying a power supply again where [according to claim 8] current supply to a system was intercepted and data

under present work is backed up like, and restoring work environment and data, When a source of a wake rise which outputted a wake rise signal is said switch, current supply of a system is intercepted, and it can constitute so that operation performed before a state under work by which DETAGA backup was carried out may be resumed.
[0022]Or a host section of the above-mentioned computer system, After supplying a power supply again where [according to claim 8] current supply to a system was intercepted and data under present work is backed up like, and restoring work environment and data, After a source of a wake rise which outputted a wake rise signal performs operation corresponding to fax or ring signal transmission of a modem, it can constitute so that current supply of a system may be intercepted again and data under work may be stored.
[0023]Or a host section of the above-mentioned computer system, After supplying a power supply again where [according to claim 9] current supply to a system was intercepted and data under present work is backed up like, and restoring work environment and data, When it is what is depended on time progress set up in order that a source of a wake rise which outputted a wake rise signal might perform a program by which scheduling was carried out, it can constitute so that a reserved program may be executed.
[0024]The thing [constituting from one integrated circuit like] according to claim 11 of a power-supply-management department of the above-mentioned computer system is preferred.
[0025]In order to solve an aforementioned problem, a host section, a power-supply-management department, and a computer system provided with volatile memory which were constituted based on the 2nd viewpoint of this invention, In executing a program reserved at the time according to claim 12 by which a user was ******(ed) like, the :aforementioned host section, While recording time reserved by timer of said power-supply-management department and storing a flag of a program executed in said nonvolatile memory, Output a current supply instruction word to said power-supply-management department, and the; aforementioned power-supply-management department, While outputting a current supply cutoff signal and intercepting current supply of a computer system, When current supply is resumed after it, a power supply signal is generated at time reserved by said timer and; current supply is resumed, said host section, It is characterized by being constituted so that a reservation program which checked a flag stored in said volatile memory, and was set as said flag may be executed.
[0026]In order to solve an aforementioned problem furthermore, according to the 3rd viewpoint of this invention, a suspension method of a computer system is provided. This suspension method The case according to claim 13 where interception of current supply arises by sudden interruption to service or a user's error working [a system] like, A step which outputs an interrupt signal when a phenomenon does not occur from peripheral equipment over fixed time, or when an instruction word set up by scheduling is set up; if said interrupt signal is outputted, A step which judges whether a flag for a central processing unit checking a setup flag and making current supply of a system intercept is set up; when the mode for making current supply of said system intercept is set up, A step which stores a hardware state of the present computer in a memory, and stores the contents of all the memories in an auxiliary storage unit; It is judged whether said present state is an interruption state, In being a cut off state of current supply by interruption-to-service generating, A step which outputs a battery cutoff signal to a power supply section for data backup, intercepts battery supply, and is made into a power OFF state; in not being a current supply cut off state by said interruption-to-service generating, Output a main power supply cutoff signal to a power supplying part, intercept a common power supply impressed, and a battery power source is supplied, It is characterized by consisting of a step changed into the state where current supply to a system is intercepted.
[0027]In a suspension method of the above-mentioned computer system, like a statement to claim 14, If the switch with which it was equipped separately operates in order for a user to intercept current supply of a system for convenience' sake at arbitrary time and to make data under present work back up, it is also possible to include further a step which outputs an interrupt signal.
[0028]In order to solve an aforementioned problem, according to the 4th viewpoint of this invention, a resume method of a computer system is provided. If interruption to service is

canceled after [according to claim 15] current supply to a system was intercepted by interruption-to-service generating and data under work has been backed up like, this resume method, Where current supply to a step and; system by which current supply to a system is resumed was intercepted and data under work is backed up, When predetermined time set up so that a wake rise signal might be outputted from a source of a wake rise, a wake rise signal might not occur over predetermined time but a wake rise might be carried out automatically passes, Where current supply to a step and; system by which current supply to a system is resumed was intercepted and data under work is backed up, If current supply is resumed, a flag of a step which performs initialization and a self-test of a system, and; current supply cut off state will be checked, When the present state is not in a state which intercepted current supply of a system and backed up data under work, A step which performs the usual boot processing; When the mode which intercepted current supply of said system and was made to back up data under work is set up, the contents of all the memories are restored from an auxiliary storage unit, It is characterized by distinguishing a source of a wake rise which outputted a step and; wake rise signal which restore work environment to a state before intercepting current supply of a system and backing up data, and consisting of a step which performs predetermined operation according to a source of a wake rise.

[0029]In a step which performs predetermined operation according to a source of a wake rise of the above-mentioned resume method, When a source of a wake rise which required a wake rise where [according to claim 16] current supply of a system was intercepted and data under work is backed up like is what is depended on switching action with which it was equipped separately, After a source of a wake rise which required a step which resumes work done before intercepting current supply of a system and making data under work back up, and; wake rise performs applicable operation according to fax or ring signal transmission of a modem, In being what is depended on time progress reserved in order that a source of a wake rise which required a step which intercepts current supply of a system again and backs up data under work, and; wake rise might perform a program by which the SUKEJU ring was carried out, It can also constitute so that a step which performs a set-up program module may be performed.

[0030]

[Embodiment of the Invention]The suitable embodiment of a computer system constituted based on this invention and a method (the suspension method and a resume method) for controlling the same is described in detail, referring to an accompanying drawing below.

[0031]As shown in drawing 1, this invention is characterized by the composition of the computer system concerning one gestalt of operation comprising the following.

Host section 1.

The power-supply-management department (PMS) 2 connected with the bus.

The power supply section (DBPS) 3 for data backup connected with the bus.

The power supplying part (SMPS) 4, the auxiliary storage unit 5, and the nonvolatile memory 6.

[0032]Said host section 1 expresses the main processing unit of the system by which this invention is applied. And said host section 1 consisted of the central processing unit 11, the system controller 12, RAM13 and ROM14, and the input output section 15, and said system controller 12 is provided with a bus controller, a DMA controller, an interruption controller, etc.

[0033]As shown in drawing 2, the composition of the power-supply-management department 2 of the computer system concerning one gestalt of operation of this invention, The input port 21 connected with the bus, the output port 22, and the controller 23 connected with the internal data bus, The SMPS interface part 24 connected with said controller 23, It consists of the main interface part 28 connected with the source interface part 25 of a wake rise connected with said controller 23, the address decoder 27 connected with the bus, said address decoder 27, and the controller 23.

[0034]The timer is built in said controller 23, and if the set-up time passes after operating simultaneously with the start of hibernation operation and counting the set-up time, a corresponding signal will be outputted from the controller 23 so that the wake rise of the system may be carried out. Said timer also counts the time set up in order to perform the program

according to scheduling.
[0035]Said source interface part 25 of a wake rise is connected with many sources 26 of a wake rise, such as a keyboard which outputs a wake rise signal from a hibernation state or fax, and a modem.
[0036]Said SMPS interface part 24 performed the signal transmission between the controller 23, the power supplying part 4, and the power supply section 3 for data backup, and has prevented malfunction by the error of a noise or data. It is also possible to constitute so that the power supplying part 4 may be built in.
[0037]It comprises one gestalt of operation of this invention so that a data input/output with the controller 23 of the host section 1 and the power-supply-management department 2 may become possible using the special data input port 21 and the output port 22. The instruction word and protocol which output and input data are constituted so that a definition may be given separately and the controller 23 may perform this.
[0038]****** separately equipped with the host interface section 28 and the address decoder 27 in order to control the input and output from the host section 1. It equips with the separate hibernation switch S1, and it is constituted so that a user can carry out by choosing a hibernation arbitrarily by a situation.
[0039]Although the computer used in one gestalt of operation of this invention is a common computer which has the computer structure of the von Neumann method, this example is applicable also to computers, such as a personal computer.
[0040]Next, operation of the computer system constituted as mentioned above is explained.
[0041]If the generating condition of the set-up hibernation interrupt is satisfied while a power supply is impressed and the computer is operating, suspend mode of the hibernation module shown in drawing 3 and drawing 4 will be performed.
[0042]If the hibernation switch S1 is operated in order to perform a hibernation arbitrarily when doing other work or removing a seat, as a user is work, the signal according to the operation of the hibernation switch S1 will be inputted into the controller 23 of the power-supply-management department 2 (S110).
[0043]When fixed time is covered and the keyboard of a computer, a mouse, the hard disk drive, etc. do not operate (i.e., when a phenomenon (event) does not occur), the host section 1 outputs a time excess signal (TIME-OUT) (S120).
[0044]A hibernation module may be started by the software by which scheduling was carried out beforehand (S130).
[0045]If the current supply from the outside is severed by sudden interruption to service etc., After the power supply section (DBPS) 3 for data backup switches an external AC power to a battery power source, a battery-operated signal (UPS one) is outputted and the outputted battery-operated signal (UPS one) is inputted into the controller 23 (S140).
[0046]The case where a hibernation switch is done by the user as above-mentioned, . [whether a time excess signal (TIME-OUT) is inputted without a phenomenon occurring over fixed time, and] If a battery-operated signal (UPS one) is inputted by interruption to service or the instruction word according to the hibernation module execution by scheduling is inputted, the controller 23 of said power-supply-management department 2 will output a high-burr NETO interrupt signal (HIBERNATE) (S150).
[0047]If a hibernation interrupt signal (HIBERNATE) is inputted, the central processing unit 11 of said host section 1, After calling a hibernation service routine, it is judged whether the hibernation setup flag stored in the nonvolatile memory 6 is checked, and the present hibernation support mode is set up (S160-S170).
[0048]Generally, in the case of PC, it is contained in BIOS which exists in ROM14, and, in the case of a multitask operating system, a hibernation service routine may be contained at the kernel of OS.
[0049]In the above-mentioned step, when the present hibernation support mode is set up, the central processing unit 11 stores the state of the present computer in hibernation service routine working clearance. That is, the central processing unit of a computer, a controller, and the present working state of an input/output device are stored in RAM13, and the data of all the

memories on the present computer is stored in the auxiliary storage unit 5 (S180-S190).
[0050]After storing the operating state and data of a computer according to execution of said hibernation, the centralized processing treatment 11 outputs a power-supply-cutoff instruction word to the power-supply-management department 2.
[0051]The address decoder 27 of said power-supply-management department 2, Decoding of the address impressed according to the power-supply-cutoff command output of said host section 1 is carried out, An applicable latch enabling signal is outputted, and a data input request signal is simultaneously outputted to the controller 23, making the input port 21 usable according to the latch enabling signal by which a seal of approval is carried out to the host interface control part 28.
[0052]Said input port 21 latches the power-supply-cutoff instruction word outputted on the system bath according to the latch enabling signal, and said controller 23 reads the power-supply-cutoff instruction word latched to the input port 21 according to the data input request outputted by the host interface control part 28.
[0053]It is made to go into a hibernation state by judging whether said controller 23 is a hibernation run state according [the present state] to an interruption state, when a power-supply-cutoff instruction word is outputted from the host section 1, and performing power-supply-cutoff operation applicable according to it (S200-S220).
[0054]If the drive of the power supplying part 4 is suspended by interruption-to-service generating, the SMPS interface part 24 will output a service interruption signal to the controller 23. Therefore, if a service interruption signal is outputted from the SMPS interface part 24, the present state will judge the controller 23 to be in the hibernation execution state by interruption to service, and it will output a battery cutoff signal (battery-off) to the power supply section 3 for data backup (S230).
[0055]Said power supply 3 for data backup interrupts the current supply of the battery which was not illustrated with a battery cutoff signal, and SMPS4 intercepts the current supply of the battery of a system according to this (S240).
[0056]In not being a hibernation run state by said interruption to service, the controller 23 outputs a main power supply cutoff signal (AC OFF) to the power supply section 3 for data backup (S250).
[0057]By the input of a main power supply cutoff signal (AC OFF), said SMPS4 interrupts AC main power supply supply, and it supplies to a system the battery power source supplied from the power supply section 3 for data backup. Therefore, said SMPS4 intercepts main power supply supply to a system, and it supplies to a system the battery power source supplied from the power supply section 3 for data backup (S260).
[0058]Thus, the current supply of a computer is interrupted and it will be in a hibernation state.
[0059]In the step (S170) which judges the setting-out propriety of said hibernation support mode, When it is judged that hibernation support mode is not set up, the central processing unit 11 outputs a battery cutoff signal (battery-off) to the power supply section 3 for data backup (S210).
[0060]The power supply section 3 for data backup makes the power supply supplied from a battery intercept according to a battery cutoff signal (battery-off), and goes into a power OFF state.
[0061]On the other hand, the power supply of a computer. [whether a user operates an electric power switch again and makes a power supply supply in the state of the hibernation of an OFF state, and] . [whether an interruption state is canceled, or a keyboard is operated and data is made to input and] A hibernation module resume process as shown in drawing 5 and drawing 6 is performed by the progress propriety of the time which the ring signal of fax, a modem, etc. was inputted, or the separate hibernation switch operated, or was set up.
[0062]That is, when the present hibernation state is what is depended on interruption-to-service generating as shown in drawing 5 and drawing 6, if interruption to service is canceled, SMPS4 will supply the common power supply impressed to a system (S320).
[0063]When the present hibernation state is not what is depended on interruption-to-service generating, the wake rise signal outputted according to the drive of the source 26 of a wake rise

is inputted into the controller 23 through the source interface part 25 of a wake rise.
[0064]If a wake rise signal is outputted from the source interface 25 of a wake rise, said controller 23, When the wake rise signal inputted is possible as compared with the mask bit set as the unillustrated internal register, a power supply signal (power turn) is outputted to the SMPS interface part 24 (S330).
[0065]When the key signal which the input from a keyboard occurs and corresponds from an unillustrated keyboard controller if it puts in another way is outputted, the source interface part 25 of a wake rise, The wake rise signal according to a key signal input is outputted, when it is permission as compared with the mask bit to which the controller 23 was set according to this, a power supply signal (power turn) is outputted, and when the signal inputted is prohibition, a wake rise demand is disregarded. A mask bit is the information about the signal set up in order to carry out the wake rise of the system in the state of a hibernation.
[0066]When the ring signal of a modem or fax is transmitted, the source interface part 25 of a wake rise outputs an applicable wake rise signal, and as compared with the mask bit to which the controller 23 was set according to this, when it is permission, a power supply signal (power turn) is outputted.
[0067]The controller 23 will output a power supply signal (power turn), if the signal applicable to the hibernation switching action with which it was separately equipped in the state of the hibernation is inputted through the input port 21.
[0068]As a result of the timer with which the inside of the controller 23 was equipped counting the time set up in the state of the hibernation unlike resumption of current supply by said wake rise, the set-up time passes, When a wake rise does not occur, in order to execute the program by which scheduling was carried out beforehand, a signal is outputted and the controller 23 outputs a power supply signal (power turn) to the SMPS interface part 25 according to this (S340).
[0069]As above-mentioned, the source of a wake rise which outputted the wake rise signal in the state of the hibernation can be distinguished, and according to the source of a wake rise, it can also constitute so that the signal of permission or prohibition may be generated selectively.
[0070]Said power supplying part 4 will resume the power source supply operation of a system, if a power supply signal (power turn) is inputted through the SMPS interface part 24.
[0071]If a power supply is again supplied from said system, the central processing unit 11 of the host section 1 will check the hibernation status flags stored in the nonvolatile memory 6, after performing initialization and the self-test of a system (S350), It judges whether it is in the present hibernation state, and the rehabilitation work to a former state is performed according to it (S360).
[0072]Said central processing unit 11 performs the usual boot processing according to current supply, when hibernation status flags are set up by the normal mode (S370).
[0073]When a hibernation flag is set up in hibernation mode, said central processing unit 11 stores all the memory contents in RAM13 from the auxiliary storage unit 5, restores data, and restores the work environment of a computer in the former state (S380-S390).
[0074]After making a former state said passage restore the work environment of a computer, the work which the central processing unit 11 distinguishes the sauce (source of a wake rise) which required the wake rise, and corresponds to the distinguished source of a wake rise is done (S400-S470).
[0075]Namely, if the command for checking the source of a wake rise which required the wake rise, and a corresponding address are outputted to the power-supply-management department 2, the central processing unit 11, Outputting a data input request signal to the controller 23 according to the address with which the host interface control part 28 is impressed, the controller 23 reads the source confirmatory order word of a wake rise inputted through the input port 21.
[0076]Said controller 23 outputs the data to the source of a wake rise which required the wake rise in the state of the hibernation according to the source confirmatory order word of a wake rise outputted from the central processing unit 11 on a system bath through the output port 22.
[0077]Said central processing unit 11 checks the source of a wake rise which required the wake

rise in the state of the hibernation according to the source data of a wake rise outputted from the power-supply-management department 2.
[0078]Said central processing unit 11 resumes the operation performed before intercepting current supply, when the source of a wake rise which required the wake rise is based on the hibernation switching action with which it was equipped separately (S410-S420).
[0079]When the central processing unit 11 is [the source of a wake rise which required said wake rise] a thing according to fax or ring signal transmission of a modem, after performing operation according to ring signal reception, i.e., the operation according to data receiving, it is again restored in the hibernation state.
[0080]Namely, when the ring signal of fax or a modem is transmitted in the state of a hibernation. After performing operation which makes a system resume and follows ring signal transmission, hibernation suspension operation can be performed again and the power consumption which is not required can be prevented (S430-S450).
[0081]The central processing unit 11 executes the program by which scheduling was carried out, when it is what is depended on set-period progress of a timer, in order that the source of a wake rise which required the wake rise may execute the program by which scheduling was carried out.
[0082]Although the above-mentioned embodiment indicated the process in which the hibernation function in a computer was performed, this invention is not necessarily limited to this example, but can be applied to all the digital systems which operate with a digital signal.
[0083]It is also possible to use it, carrying out the IC form of each component for performing said hibernation function.
[0084]
[Effect of the Invention]As mentioned above, when adding an interface logic with the host of a system separately and making it the data between a host and an interface controller and input and output of an instruction word attained according to this invention, Alternative masking operation according to the source of a wake rise which impresses a hibernation can be performed. Various motion control is possible in the state of a hibernation, and a computer system applicable also to a digital system and a method (the suspension method and a resume method) for controlling the same other than PC are provided.

[Translation done.]